

### **ABSTRACT OF THE DISCLOSURE**

Blood cells of interest are readily distinguishable from other blood cells and look-a-like particles found in a blood sample by their back-scatter signature. A preferred method for differentiating platelets in a blood sample is to irradiate the cells and particles, one at a time, with a beam of radiation, and to detect back-scattered (reflected) radiation using a plurality of optical fibers to transmit the back-scattered radiation to a high-gain photodetector, e.g. a photomultiplier tube. Preferably, the back-scatter signal so obtained is combined with a second signal representing, for example, either the level of forward-scatter within a prescribed, relatively narrow angular range, or the level of side-scattered radiation, or the level of attenuation of the cell-irradiating beam caused by the presence of the irradiated cell or particle in the beam, or the electrical impedance of the irradiated cell or particle, to differentiate the cells of interest. The method and apparatus of the invention are particularly useful in differentiating platelets and basophils in a blood sample.